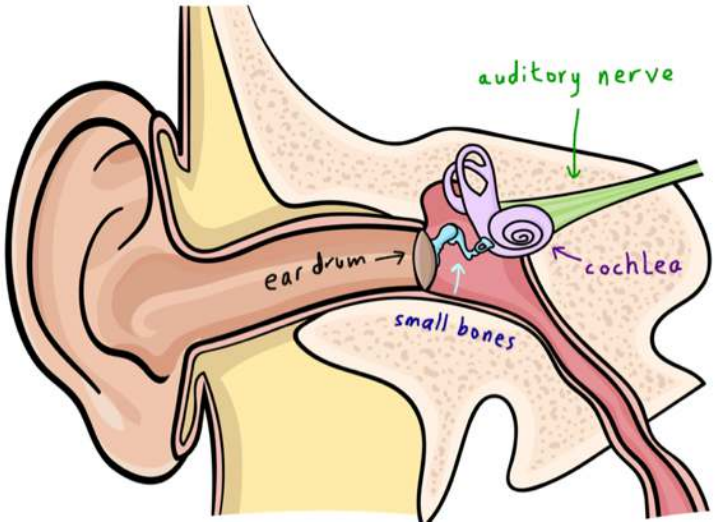
0 1 The main parts of the human ear are shown in the below diagram.



0 1 . 1 Explain how the incidence of a sound wave onto the ear drum causes the brain to perceive (or 'hear') a sound.

[3 marks]

0 1 . 2 In what way is the operation of the human ear similar to that of a moving coil microphone?

[1 mark]

0 1 . 3 What are the minimum and maximum frequencies which a human can hear?

Minimum = _____ Hz Maximum = _____ Hz

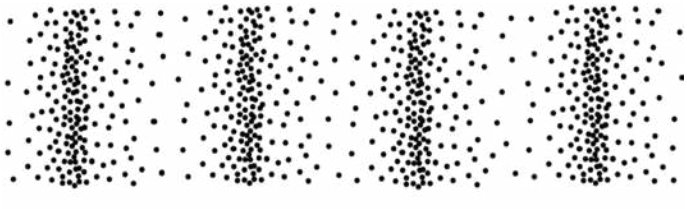
[1 mark]

0 1 . 4 As we get older, both the range and sensitivity of our hearing gets worse. Write down one possible cause of this hearing loss.

[1 mark]

0 2

The below **full-scale** diagram represents a sound wave as it travels through the air.



0 2 . 1

Mark the positions of each of the **compressions** in the above sound wave with the letter **C**.

[1 mark]

0 2 . 2

Use a ruler to determine the **wavelength** of this wave.

Wavelength = _____ cm

[1 mark]

0 2 . 3

Hence determine its **frequency**. The speed of sound in air is 340 m/s.

Frequency = _____ Hz

[2 marks]

0 2 . 4

Will this wave be audible to a young person with normal hearing?

Yes ☐

No ☐

[1 mark]

0 2 . 5

This wave is then incident onto the surface of a lake, and is partially transmitted into the water. How (if at all) will its frequency and wavelength change as it enters the water? The speed of sound in water is approximately 1500 m/s.

_____

_____

[2 marks]